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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,983	06/04/2001	Satoshi Ichikawa	208526US-2S CONT	3486

22850 7590 04/18/2002

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EXAMINER
SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 04/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/871,983	Applicant(s) Ichikawa et al.
	Examiner Barbara Summons	Group Art Unit 2817

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-8 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 2, 7 and 8 is/are rejected.

☒ Claim(s) 3-6 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The drawing(s) filed on 6/4/01 is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☒ All ☐ Some* ☐ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

Office Action Summary

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the surface acoustic wave (SAW) device "wherein one of the transducers connected in parallel and another transducer are formed on different chips" as recited in claim 8, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Specification

2. The disclosure is objected to because of the following informalities: On page 8, line 3, note that "SPUD" should be --SPUDT--. Appropriate correction is required.

Claim Objections

3. Claims 3-6 are objected to because of the following informalities:

Each of claims 3-6 includes a limitation that begins "if one of the transducers..." (see line 2) wherein "if" should be removed as being a non-positive limitation. Furthermore, each of claims 3-6 states that a "transducer" has resonant frequencies of "Fl1, Fc1 and Fu1" or "Fl2, Fc2 and Fu2", wherein it is a **filter** which has the three resonant frequencies (see e.g. the spec. at the paragraph spanning pages 12 and 13). Claim 2 is not objected to since it is understood that one of the triple-mode resonant frequencies is provided by each of the RSPUDTs in a filter. In order to correct the above listed problems, the Examiner suggests the following changes:

In claim 3, on line 2, "if" should be changed to --a first filter including--;

on line 4, "and" should be followed by --a second filter including--; and

on line 5, the comma "," should be followed by --and--.

In claim 4, on line 2, "if" should be changed to --a first filter including--; and

on line 4, "and" should be followed by --a second filter including--.

In claim 5, on line 2, "if" should be changed to --a first filter including--;

on line 4, "and" should be followed by --a second filter including--; and

on line 5, the comma "," should be followed by --and--.

In claim 6, on line 2, "if" should be changed to --a first filter including--;

on line 4, "and" should be followed by --a second filter including--; and

on line 5, the comma "," should be followed by --and--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Dai et al. U.S. 5,896,071.

Regarding claims 1 and 7, Fig. 9 of Dai et al. discloses a surface acoustic wave (SAW) device comprising two or more transducers [i.e. resonant single phase unidirectional transducers (RSPUDTs) R1, R2, R1M and R2S] formed on a single chip piezoelectric substrate 76 and including a pair of regions (e.g. RSPUDTs R1 and R2), each of the regions/RSPUDTs having a pair of comb electrodes whose surface wave propagation directions are opposite to each other, as best seen in Fig. 7. That is, each of the RSPUDTs which are considered a "region" labeled B as shown in Fig. 5, is made up of the structure in Fig. 7 which has a pair of comb electrodes 42 and 44, and wherein propagation directions to the left and right of the central finger 62 are opposite to each other toward the central finger 62 (see col. 5, lns. 34-40). Furthermore, at least two of the transducers, R1 and R1M, are connected in parallel between terminal 78 and ground. Regarding claim 8, Dai et al. also discloses that the filters may be formed on different piezoelectric substrate chips (see col. 7, lns. 9-11).

Regarding claim 2, Fig. 10 shows an embodiment wherein the transducer R1 has a triple-mode resonant frequency characteristic provided by resonant cavity C1, and the remaining two resonant characteristics of the top filter in the figure are provided by resonant cavities C2 and C3. In Fig. 10 the transducers R2 and R2S are connected in parallel between a terminal and ground.

Allowable Subject Matter

6. Claims 3-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to disclose or fairly suggest a SAW device having each of the specifically recited features and especially having the recited "regions having a pair of comb electrodes whose surface wave propagation directions are opposite to each other" (see claim 1, lns. 3-5) in combination with transducers having "a triple-mode resonant frequency characteristic" (see claim 2), wherein the six individual resonant frequencies are related in the manners specifically recited in claims 3-6.

Although the prior art of record discloses unidirectional transducers coupled in parallel and also discloses utilizing triple-mode filters (i.e. three resonant characteristics) to widen filter bandwidth (see also other art cited below), there is no suggestion in the SAW filter art to combine the unidirectional transducer with triple-mode filters having the specifically recited relationships of the six resonant frequency characteristics.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following three references show triple-mode SAW filters that use bi-directional rather than unidirectional transducers.

Onozawa et al. JP 10-294644 discloses two triple-mode SAW filters connected in parallel such that the phases of the resonant frequencies in the two filters are opposite (see e.g. Fig. 1).

Yamamoto et al. U.S. 5,392,013 discloses widening a SAW filter pass band by utilizing a triple-mode SAW filter.

Kajihara et al. U.S. 5,559,483 discloses connecting two triple-mode SAW filters in parallel (see Figs. 4-6).

Hode et al. U.S. 5,475,348 discloses parallel connected SAW filters using unidirectional transducers (see e.g. Figs. 2, 10 and 14).

Yamada et al. U.S. 6,104,260 discloses parallel connected SAW filters using unidirectional transducers (see e.g. Fig. 6).

Morgan U.S. 5,663,696 discloses parallel connected SAW filters using unidirectional transducers (see Fig. 1 and col. 8, lns. 20-25).

Kidoh U.S. 6,147,574 discloses a SAW transducer which has a portion unidirectional in a forward direction and a portion unidirectional in a backward direction (see e.g the abstract and Figs. 2-4 with direction arrows C and D).

Peach U.S. 4,733,207 and Kondratyev et al. U.S. 5,646,584 are U.S. equivalents of references cited by Applicants on the I.D.S. paper #3.

9. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956.

April 12, 2002 : BSummons

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